

groined vault, with foliated ribs of singular but elegant design. From its large size, and the buildings attached to it on either side, it appears probable that this gatehouse was the residence of the abbot.

Some of the other domestic buildings of the abbey remain in a more or less ruinous state; they are of the thirteenth century, and retain their groined vaults with arched ribs only, which spring from the walls without shafts or capitals, or even moulded imposts, the arch merely dying into the wall. The keys of these vaults are ornamented with bold and good Early English bosses, the sculpture of which is very free and characteristic.

Of the chapter-house two sides are tolerably perfect, ornamented with panelling, in imitation of a window of three lights, with foliated circles in the head, and an arcade under it, the whole of very good Early English work, beautifully moulded, the date of it being, as already stated, circa 1282, early in the reign of Edward the First (fig. 10). Some small portions of the church remain, and belong to nearly the same period. One aisle of a transept has its vault and arcades on each side of very singular Early English work, with corbels in the place of capitals. There is one window, or rather panel, of three divisions, with three foliated circles in the head, filled up with a sort of fleur-de-lis; under this is an Early English piscina.

The mouldings of this work are very good, as will be seen by their sections given above. They are Early English, but late in the style, approaching to the Decorated. A comparison of these remains with the choir of Merton College Chapel, Oxford, built at the same period, will go far to prove that in the beginning of the reign of Edward the First the change of style was in rapid progress, and that works previously commenced were finished in the earlier style, while new buildings then begun were in the later.

Description of Engravings.

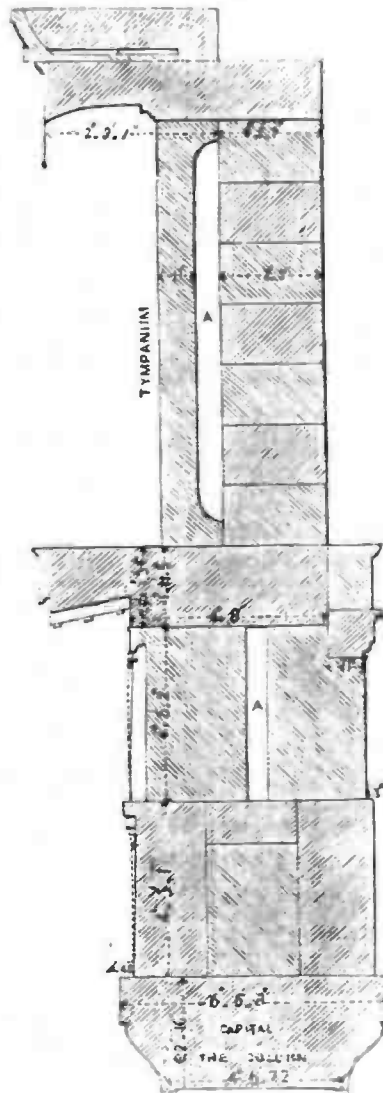
- Fig. 1. Window of second floor, east front of gateway.
- Fig. 2. Oriel window in gate-house, circa 1382.
- Fig. 3. Jamb of entrance to gate-house, north front.
- Fig. 4. Jamb of east front of gate-house.
- Fig. 5. Jamb of archway on which the doors are hung. Archmoulds the same.
- Fig. 6. Jamb of door south side. Base mould of west front. String of turret of east front.
- Fig. 7. Corbel showing springing of rib between gate-arch and east archway.
- Fig. 8. Details of groining of gate-house.
- Fig. 9. Details of window of chapter-house, A.D. 1282.
- Fig. 10. Elevation of north-east bay of chapter-house, circa 1282.

ON CERTAIN PECULIARITIES IN THE DESIGN AND CONSTRUCTION OF THE PARTHENON.*

BY J. J. SCOLLS, ARCHITECT.

MR. PENROSE has given us some interesting information respecting the curved lines of this once magnificent building, which shews the refined state of Greek art at the period this temple was built, and the great attention paid by the artists of that nation to make their buildings as effective as possible, by counteracting, when possible, those optical delusions common in all buildings. It is well known to architects, that if the shafts of columns are made perfectly straight, that the effect to the eye would be an appearance of curving inwards; and this unpleasant effect is remedied by giving an entasis or swelling to the columns. As Stuart and Revett had not shewn any entasis to the columns of the Parthenon, I felt a desire, when I was at Athens, to ascertain if the architect of the Parthenon had overlooked this point, if these columns were really executed without any entasis; I had the opportunity of measuring each diameter of the blocks of a fallen column, which clearly proved that an entasis was given, but so slightly as not to give any appearance of swelling out, which is so often seen in the buildings of Italy, but yet sufficient to correct the defect that would have been apparent if the shafts had had a straight line. I have much pleasure in bearing testimony to the satisfactory researches of Mr. Penrose on this point, whose calculations of the diameter of the various stones, on the assumption that

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the curve was a hyperboloid, came so near my actual measurements, as to prove not only the accuracy of his theory, but also the inaccuracy of one of my dimensions, which produced at one part a cripple to the curve when drawn out, and must, in execution, have been very perceptible, and which his formula easily detected.

The necessity of giving "entasis" to the sides of tapering shafts was not overlooked by the architects of the middle ages; for if I remember rightly, this fact was brought to our notice by our honorary secretary, Mr. Poynter, at one of our meetings, when the subject of the restoration of Redcliff Church, Bristol, occupied our attention; and that gentleman remarked, that the spires of our Gothic churches had that swelling or deviation from a straight line; and Professor Hosking, who favoured us with his remarks on the restoration of this church, corroborated Mr. Poynter's statement by instancing the spire of this building, which, though only partly erected, shewed a deviation from a straight line.

I question if the architects or builders of the middle ages formed their entasis on the geometric principles of *Letinus*; but without disparaging their mathematical knowledge, I am inclined to think they worked very often by what is sometimes called the "rule of thumb," and perhaps like many of the Italian architects of that period, and also like many workmen of our own time; in the west of England

they worked the sides of their spires and columns from the base upwards to one angle, a portion of the height, and the remainder to a more acute angle, perhaps cutting by the eye the junction or angle formed by these two inclines. As in some manner connected with entasis, I would beg here to remark more particularly for the use of our younger members, that the *antæ* in Greek buildings have a slight diminution, sufficient only to prevent the upper diameter appearing larger than the lower one, which is invariably the case where the diameters at each end are the same. I allude to this diminution in the *antæ* because many writers have laid it down as the law, that Greek *antæ* do not diminish, but in all the instances I have met with the diminution is to be discovered.

Mr. Penrose has ascertained, that not only the Parthenon but also other buildings of Greek architecture have the steps, architrave, cornices, &c., curved upwards in the centre; I had heard rumours of late years to the same effect respecting the Parthenon, and I was inclined to attribute this deviation from the straight line to some defect or sinking at the extremities; but from the information I have received from Mr. Penrose, whom I have questioned very closely on this subject, with reference to any appearance of settlement or displacement of the stones or separation at the joints, I now quite agree with him, that these

* Read at Institute of British Architects 23rd ult.